

Abstract

Sub 25

The present invention provides a method for refining microstructure of metallic materials and the present invention relates to a method in which cavitation (cavities) is formed in molten metal by the application of high-energy vibrating force to a metal in the process of solidification, and the newly formed solid crystal particles are crushed by the impact pressure generated during the collapse of the cavities to refine the microstructure of the material, and high-energy electromagnetic vibrating force is applied to a solidifying metal sample 10 by the simultaneous imposition of an electric current and a magnetic field in an apparatus comprising an electromagnet 12 for applying a stationary magnetic field and an electrode 11 for passing an alternating current through the metal sample, so that the solid crystal particles are crushed into small pieces, yielding a fine microstructure thereof.